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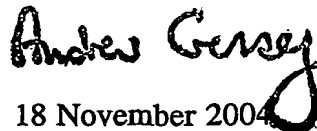
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11NOV03 E851056-1 001821
P01/7700 0.00-0326200.3

Request for grant of a patent

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Cardiff Road
Newport
South Wales
NP10 8QQ

1. Your reference

Jg-3055

2. Patent application number

(The Patent Office will fill in this part)

0326200.3

1 0 NOV 2003

3. Full name, address and postcode of the or of each applicant (underline all surnames)

Noel Tierney,
84 Hope Street,
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United Kingdom

John Cropper,
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M35 OPT
United Kingdom

Patents ADP number (if you know it)

8750119001

If the applicant is a corporate body, give the country/state of its incorporation

8750127001

4. Title of the invention

TARGET APPARATUS

5. Name of your agent (if you have one)

Graham Jones & Company

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

77 Beaconsfield Road,
Blackheath,
London,
SE7 7BE

Patents ADP number (if you know it)

2097001

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number

Country

Priority application number
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Date of filing
(day / month / year)

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application

Date of filing
(day / month / year)

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if:

No

- a) any applicant named in part 3 is not an inventor, or
 - b) there is an inventor who is not named as an applicant, or
 - c) any named applicant is a corporate body.
- See note (d))

Patents Form 1/77

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Continuation sheets of this form

Description

10 ✓

Claim(s)

Abstract

Drawing(s)

9 19 ✓

10. If you are also filing any of the following, state how many against each item.

Priority documents

Translations of priority documents

Statement of inventorship and right to grant of a patent (*Patents Form 7/77*)

Request for preliminary examination and search (*Patents Form 9/77*)

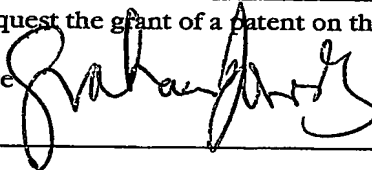
Request for substantive examination (*Patents Form 10/77*)

Any other documents
(please specify)

11.

I/We request the grant of a patent on the basis of this application.

Signature



Date 10th Nov. 2003

12. Name and daytime telephone number of person to contact in the United Kingdom

Graham H. Jones 020 8858 4039

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Notes

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TARGET APPARATUS

This invention relates to target apparatus. The target apparatus is especially useful for use for air gun target practice but it may be used for target practice with other guns if desired.

Various types of target apparatus for use with air guns are already known. These known types of target apparatus basically fall into two categories, one category of which is known as a spinner target, and the other category of which is known as a knock down target. The spinner target is available in various forms but it basically comprises a metal disc or discs of different sizes mounted on a shaft which spins when struck by an air gun pellet or other projectile. Spinner targets are normally mounted on a spike driven in the ground.

The knock down target usually comprises a target profile and a single target receiving station in the form of an aperture. This aperture is usually in a chest area of the target profile. The aperture is backed by a metal plate which, when struck, causes the whole target to fall down. Resetting of the target is by means of a lanyard which may be up to fifty meters long. The lanyard is pulled and this causes the target to stand up again. The knock down target usually has a non-adjustable base. This base is suitable for use on flat ground but it is not suitable if the knock down target is to be mounted on an uneven surface. Because the target must be reset manually by pulling on the lanyard, this requires that the air rifle, air pistol or other firearm

is put down whilst making the resetting. This can disturb the concentration of a person shooting and this is undesirable.

It is an aim of the present invention to provide target apparatus which is an improvement over the above two types of known target apparatus.

Accordingly, in one non-limiting embodiment of the present invention there is provided target apparatus comprising a target profile, a container for containing a plurality of targets, a first receiving station in the target profile and for receiving the targets from the container, a second receiving station in the target profile and for receiving the targets from the container, feed means for feeding the targets one at a time from the container to the first and second receiving stations, and drive means for causing the automatic operation of the feed means each time a target is hit and destroyed.

The target apparatus may be one in which the feed means is a sweeping arm feed means. Other types of feed means may be employed.

The sweeping arm feed means preferably comprises an arm which sweeps an open dispensing end of the container and causes the delivery of the targets one at a time from the container. The container may include biasing means for biasing the targets in the container towards the open dispensing end of the container. The biasing means may be a spring and plate arrangement. Other types of biasing means may be employed.

Preferably the drive means is a mechanical drive means. Other

The mechanical drive means is preferably a spring powered drive means. The spring powered drive means preferably includes a constant force spring.

The mechanical drive means may include a pulley arrangement. The pulley arrangement may comprise a drive pulley, a drive belt, a cam pulley and a connecting rod, the connecting rod being such that it connects the cam pulley to the feed means.

Usually, the target profile will be that of an animal, person or object. Any suitable and appropriate animal, person or object may be employed. Thus, for example the target profile may be in the form of a crow, rabbit or squirrel.

Preferably, the target apparatus is one in which the first receiving station is in a head part of the target profile, and in which the second receiving station is in a body part of the target profile.

The target profile may be a non-moving target profile.

Alternatively, the target profile may be a moving target profile. The target apparatus may then be one in which the moving target profile is a rocking target profile, and in which the target apparatus includes rocker means for causing the moving target profile to rock. The rocker means is preferably an eccentric cam and spring arrangement. Other types of rocker means may be employed.

The target apparatus may include a base on which the target profile stands. Various designs for the base may be employed.

Usually, the first and the second receiving stations will be apertures. The apertures may be circular apertures or apertures of any other shape. The first and the second apertures may be of the same size or of different sizes.

The target apparatus may include size-reducing means for reducing the size of each one of the apertures.

The target apparatus may be one in which the size-reducing means is a first insert for being received in the aperture forming the first receiving means, and a second insert for being received in the aperture forming the second receiving means, and in which the first and the second inserts each has an insert aperture which is smaller than the aperture into which the insert is placed.

The target apparatus of the present invention may be manufactured and sold with or without the targets. The targets can be bought separately for subsequent installation in the container if desired.

Embodiments of the invention will now be described solely by way of example and with reference to the accompanying drawings in which:

Figure 1 is a rear view of part of target apparatus of the present invention;

Figure 2 is a side view of the part of the target apparatus shown in Figure 1;

FIGURE 1

Figure 4 is a top view of the container part of the target apparatus shown in Figure 3;

Figure 5 is a view from underneath of drive means forming part of the target apparatus shown in Figure 1;

Figure 6 is a side view of the drive means shown in Figure 5;

Figure 7 shows the target apparatus of Figure 1 mounted on a stand, and as viewed through a sight of a firearm;

Figure 8 is an elevated front view of the stand as shown in Figure 7;

Figure 9 is a side view of the stand as shown in Figure 8;

Figures 10a – 10f show six stages of operation of the target apparatus shown in Figure 1;

Figure 11 is a front view of size reducing means;

Figure 12 is a side view of the size reducing means shown in Figure 11; and

Figure 13 is a rear view of the size reducing means shown in Figure 11.

Referring to the drawings, there is shown target apparatus 2 comprising a target profile 4, and a container 6 for containing a plurality of targets 8. There are in fact twenty of the targets 8 and, as shown in Figure 3, the targets 8 are 3mm chalk discs but other types of targets may be employed.

The target apparatus 2 also comprises a first target receiving station 10 which is in the target profile 4 and which is for receiving the targets 8 from the container 6. The target apparatus 2 also further comprises a

second target receiving station 12 which is also in the target profile 4 and which is also for receiving the targets 8 from the container 6.

The target apparatus 2 includes feed means 14 for feeding the targets 8 one at a time from the container 6 to the first and second receiving stations 10, 12. The target apparatus 2 also comprises drive means 16 for causing automatic operation of the feed means 14 each time a target 8 is hit and destroyed.

The feed means 14 is a sweeping arm feed means 14 having an arm 18 which sweeps an open dispensing end 20 of the container 6, and causes the delivery of the targets 8 one at a time from the container 6.

As shown in Figure 3, the container includes biasing means 22 for biasing the target 8 in the container 6 towards the open dispensing end 20 of the container 6. The biasing means 22 is a spring and plate arrangement comprising a compression spring 24 and a push plate 26.

The drive means 16 is a mechanical drive means. As best seen from Figure 1, the mechanical drive means 16 is a spring powered drive means including a constant force spring 28. The drive means 16 also includes a pulley arrangement 30. The pulley arrangement 30 comprises a drive pulley 32, a drive belt 34, a cam pulley 36 and a connecting rod 38. The drive belt 34 is made of spring steel which provides good gripping and also a buffer action when transferring power from the drive pulley 32. The connecting rod

appropriate shape. The first receiving station 10 is in a head part 40 of the target profile 4. The second receiving station 12 is in a body part 42 of the target profile 4.

The target profile 4 is a moving target profile 4. More specifically, the moving target profile 4 is a rocking target profile which is caused to rock by rocker means 44. The rocker means 44 comprises an eccentric cam 46 and a spring 48. The spring 48 is an elongate spring which has one end 49 which bears on the profile 50 of the eccentric cam 46. This causes the rocking to be in the form of a bobbing action. The other end 51 of the spring 48 is located in a base 52 of the target apparatus 2. The base 52 is connected to the target profile 4 by a leg 54. The leg 54 is pivotally hinged by a pivot 56 to the base 52, and is also pivotally hinged by a pivot 58 to the body part 42.

As shown in Figure 4, the container 6 is mounted on a support 60 which has slots 62 at each end. The slots 62 fit over bolts 64 which terminate in nuts 66. This arrangement enables the support 60 and the container 6 easily to be removed for being refilled with the targets 8.

As shown in Figures 3 and 4, the container 6 is provided with a cocking rod 68 and an arrestor pin 70. As shown in Figures 1 and 6, the spring 32 is wound up using a winding handle 72. As can be seen from Figure 6 the drive pulley 32 has a serrated edge 74 to ensure good grip of the drive belt 34. The drive pulley 32 and the eccentric cam 46 are mounted on a main shaft 76. The main shaft 76 is split to secure one end of the spring 28. The split is shown in Figures 5 and 6 as split 78. The spring 28

has its other end 80 secured around a hole 82 which accommodates the spring loaded winding handle 72.

Figure 5 also shows how the target apparatus 2 is provided with an axial hole 84 for receiving the main shaft 76. A hole 86 is also provided in a base plate 88. A spring loaded pin from the winding handle 72 is pushed into a corresponding hole in the cam profile in order to lock the mechanism.

Figure 7 shows the target apparatus 2 with a target 8 in position in the second target receiving station 12. The target apparatus 2 is shown being viewed through a sight 90 of a fire arm such for example as an air rifle. The target profile 4 is shown mounted on a base 92. The base 92 has a platform portion 94 and three legs 96. The legs 96 are shown having pointed ends for enabling the base 92 to be pushed into soft ground. The platform portion 94 has upstanding members 98 for receiving the foot part 52 of the target profile 4.

Figures 8 and 9 show the base 92 in more detail. In Figures 8 and 9, the legs 96 have been turned upside down from the position shown in Figure 7. This is permitted by having the legs 96 separable from the platform portion 94 and this is achieved as shown in Figure 9 by means of wing nuts 100 and bolts 102. Only one wing nut 100 and bolt 102 have been shown for ease of illustration. With the legs 96 in the position shown in Figures 8 and 9, the legs 96 have a foot part 104 for enabling the base 92 to be pushed into soft ground. The main shaft 76 is shown in Figure 8 passing through the axial hole 84 in the base plate 88. The winding handle 72 is shown in Figure 9 in a position to be pushed into the hole 86 in the base plate 88.

Figures 10a – 10f show six stages of operation of the target apparatus 2. As can be seen from Figures 10a – 10f, each time a target 8 is hit and destroyed, the feed means 14 is automatically operated by the drive means 16 to feed the targets 8 one at a time from the container 6 to the first or the second receiving station 10, 12 requiring a target 8. As can be seen from the explanatory wording included in Figures 10a – 10f, the feed means 16 is prevented from moving when a whole target 8 is in position in the first and second receiving stations 10, 12. The use of pins 106 for holding the target 8 in position will be noted, see for example Figure 10b. The connecting rod 38 moves vertically and causes the pick up arm 18 to have a head/body/head/body sweeping motion.

Figures 11 – 13 shown size-reducing means 108 for reducing the size of each one of the apertures which form the first and the second target receiving stations 10, 12. The size-reducing means 108 is an insert 110 which is for being received in a chosen one of the first and the second target receiving stations, 10, 12. The insert has an aperture 112 which is smaller than the aperture forming the first or the second target receiving station 10, 12. A slot 114 allows the insert 110 to be compressed prior to insertion so that the insert 110 grips when it is in position. The insert has a shoulder 116 which is of an appropriate size depending upon whether or not the insert 110 is to fit into the first target receiving station 10 or the second target receiving station 12. The insert 110 has an overlap part 118 for sitting on the front face of the target profile 4 as best shown in Figure 12.

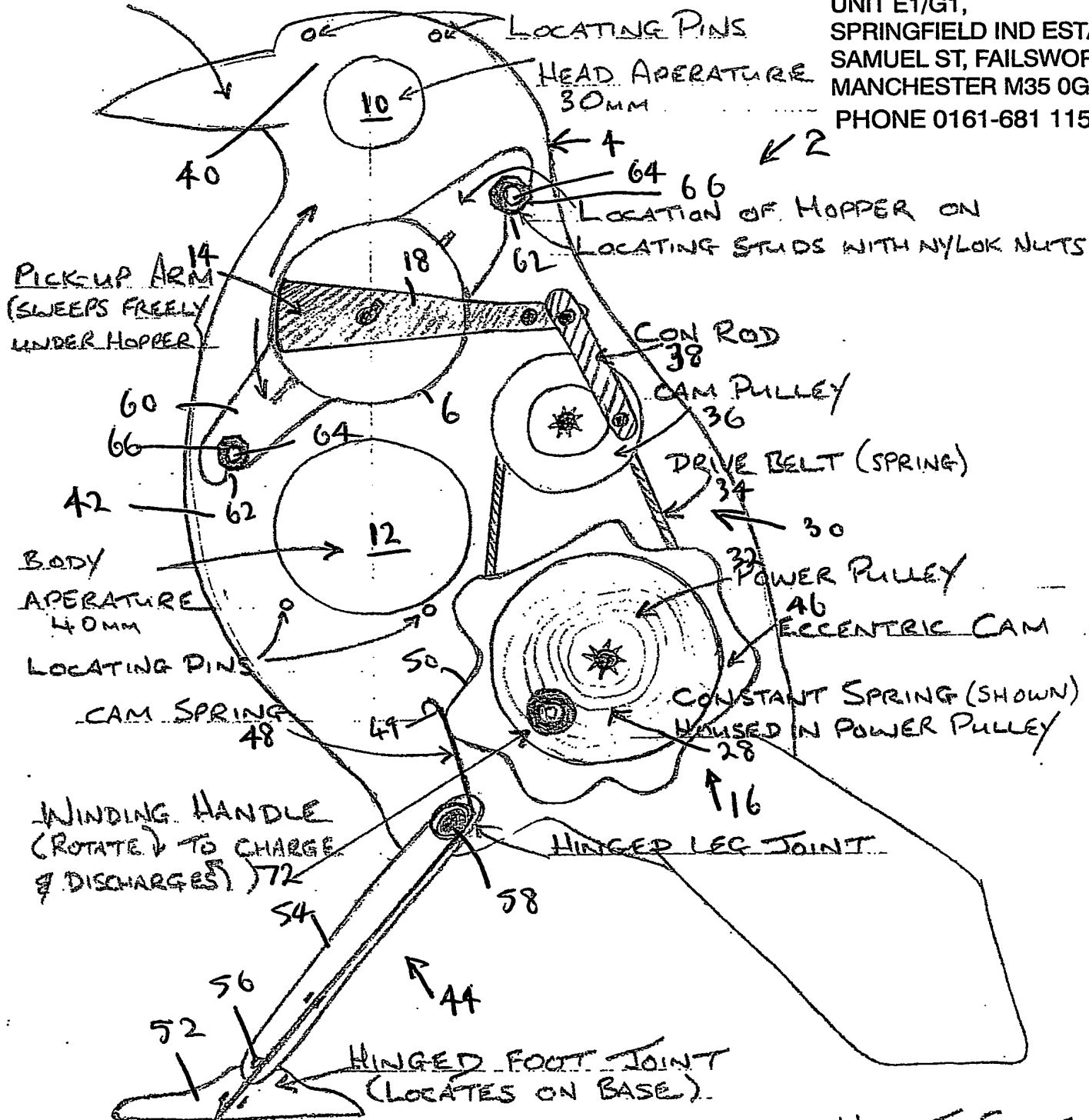
It is to be appreciated that the embodiments of the invention described above with reference to the accompanying drawings have been given by way of example only and that modifications may be affected. Thus, for example, the target profile 4 could be a non-moving target profile if desired. The target profile 4 may be of a wide variety of different shapes and sizes to that shown in the drawings.

TARGET INNOVATIONS

DESIGNERS & MANUFACTURERS OF AUTOMATED
AIRGUN TARGETS

PROFILE (CROW)

UNIT E1/G1,
SPRINGFIELD IND ESTATE
SAMUEL ST, FAILSWORTH
MANCHESTER M35 0GA
PHONE 0161-681 1150



REAR ELEVATION

FIG 1

MARKETING DIRECTOR JOHN CROPPER · DESIGN DIRECTOR NOEL TIERNEY



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TARGET INNOVATIONS

DESIGNERS & MANUFACTURERS OF AUTOMATED
AIRGUN TARGETS

THE A.R.A.T.
SIDE ELEVATION

UNIT E1/G1,
SPRINGFIELD IND ESTATE
SAMUEL ST, FAILSWORTH
MANCHESTER M35 0GA
PHONE 0161-681 1150

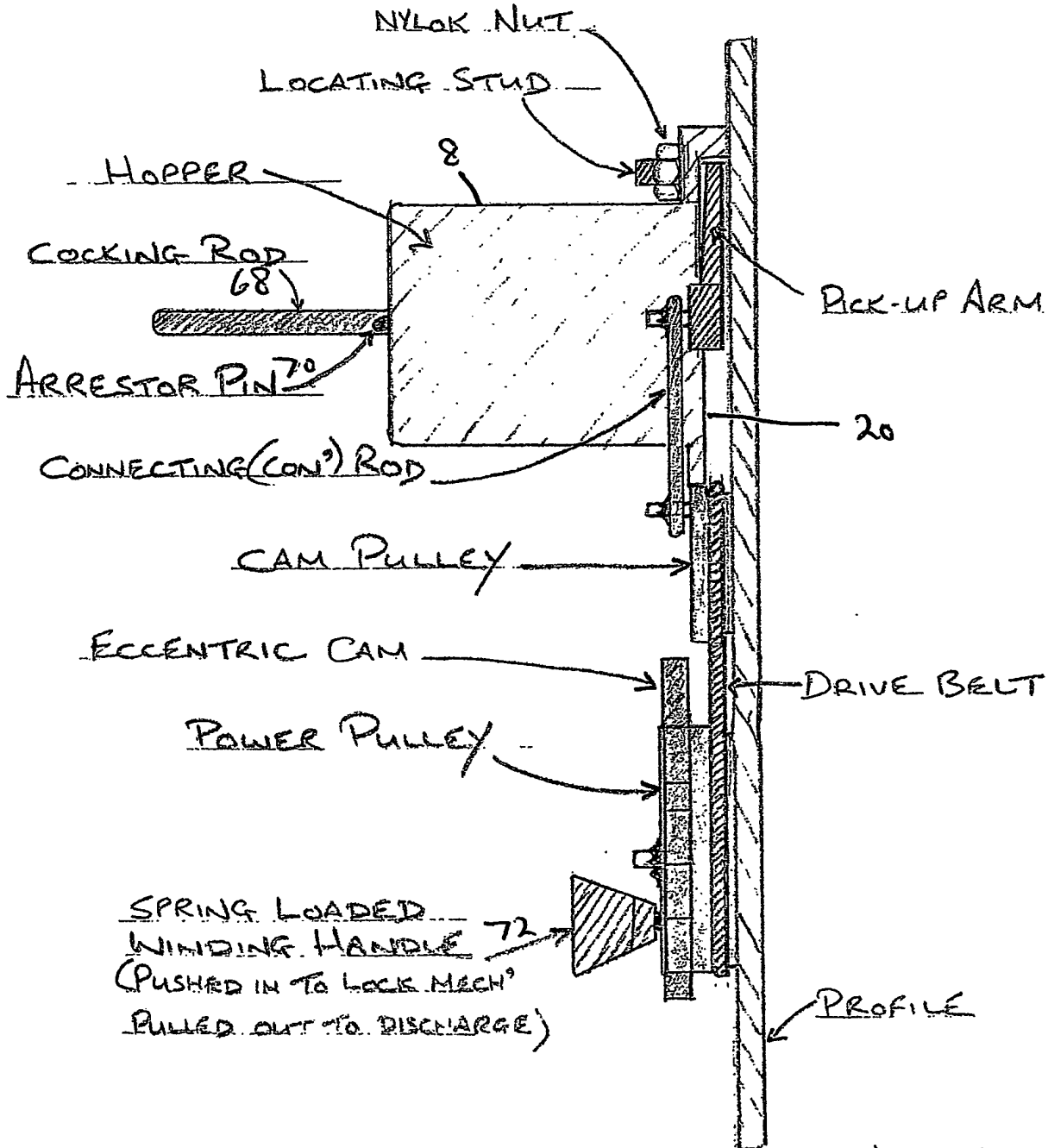


FIG 2

NOT TO SCALE

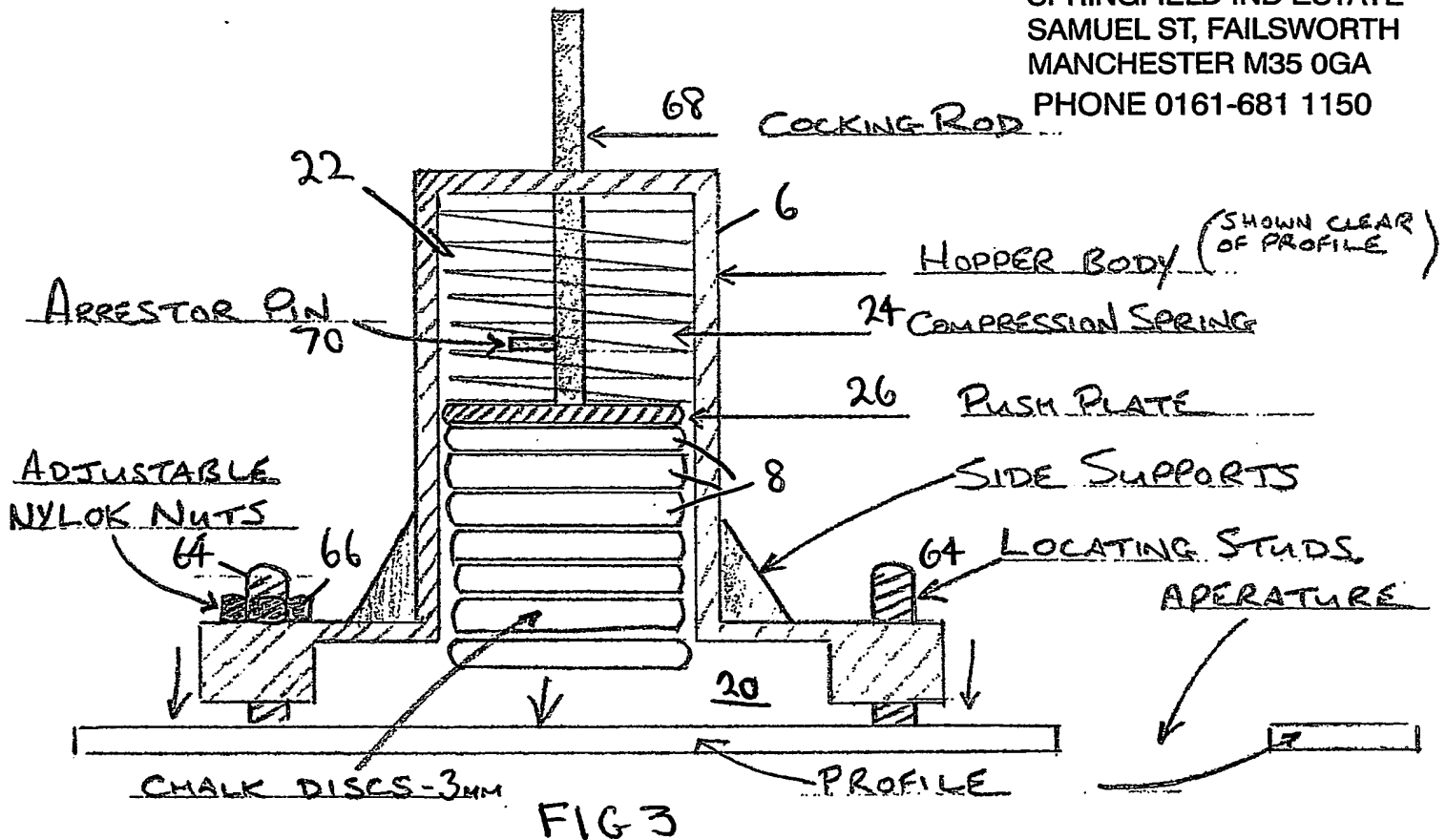


TARGET INNOVATIONS

DESIGNERS & MANUFACTURERS OF AUTOMATED
AIRGUN TARGETS

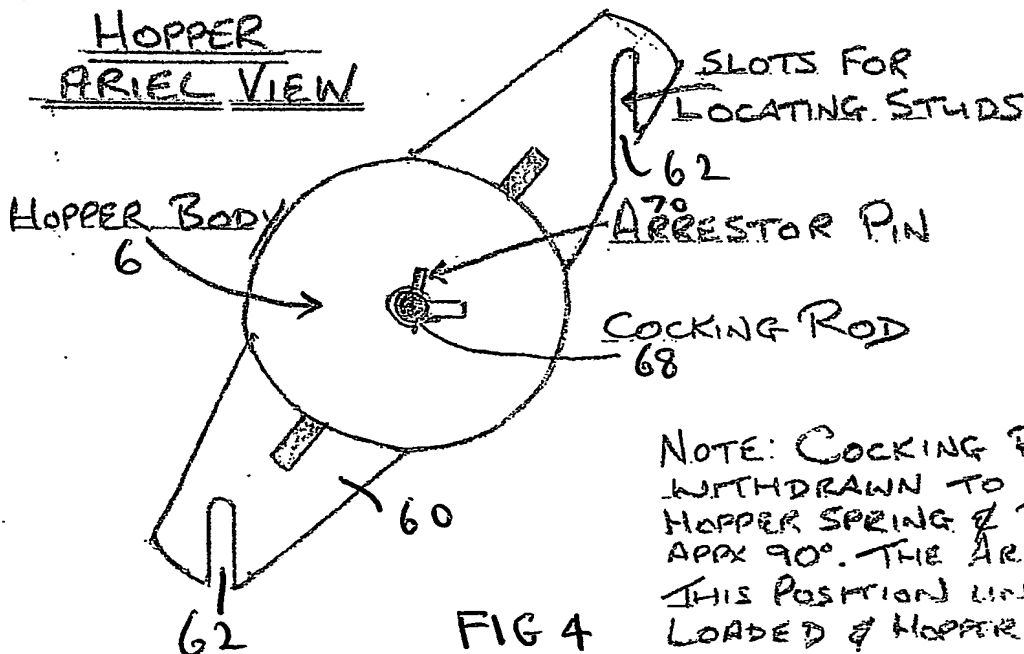
HOPPER SIDE ELEVATION

UNIT E1/G1,
SPRINGFIELD IND ESTATE
SAMUEL ST, FAILSWORTH
MANCHESTER M35 0GA
PHONE 0161-681 1150



NOT TO SCALE

HOPPER PRIEL VIEW



NOTE SLOT IN TOP
OF HOPPER TO ALLOW
PASSAGE OF THE
ARRESTOR PIN.

NOTE: COCKING ROD IS
WITHDRAWN TO COMPRESS THE
HOPPER SPRING & ROTATED THROUGH
APX 90°. THE ARRESTOR MAINTAINS
THIS POSITION UNTIL DISCS ARE
LOADED & HOPPER IS IN PLACE.

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TARGET INNOVATIONS

DESIGNERS & MANUFACTURERS OF AUTOMATED
AIRGUN TARGETS

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MANCHESTER M35 0GA
PHONE 0161-681 1150

Power Pulley (VIEWED FROM UNDERSIDE)

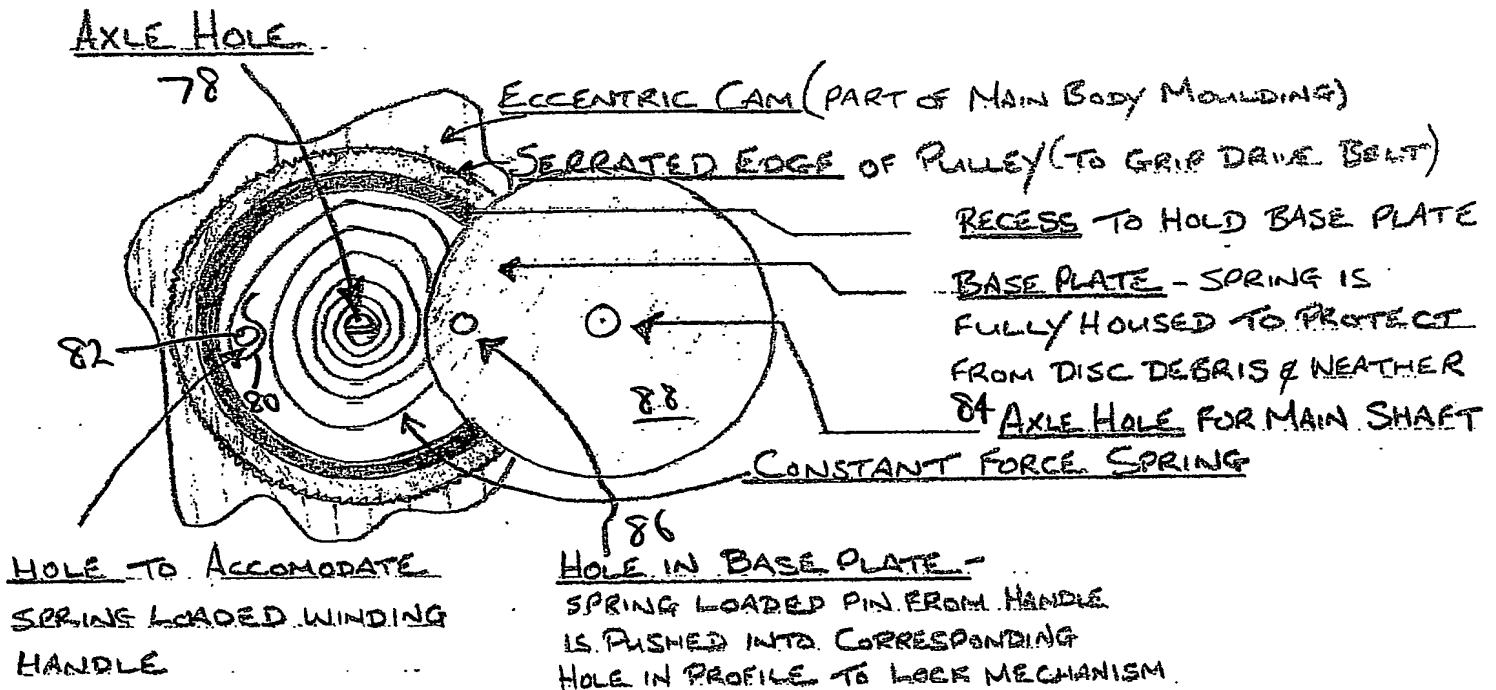


FIG 5

Power Pulley (SIDE VIEW)

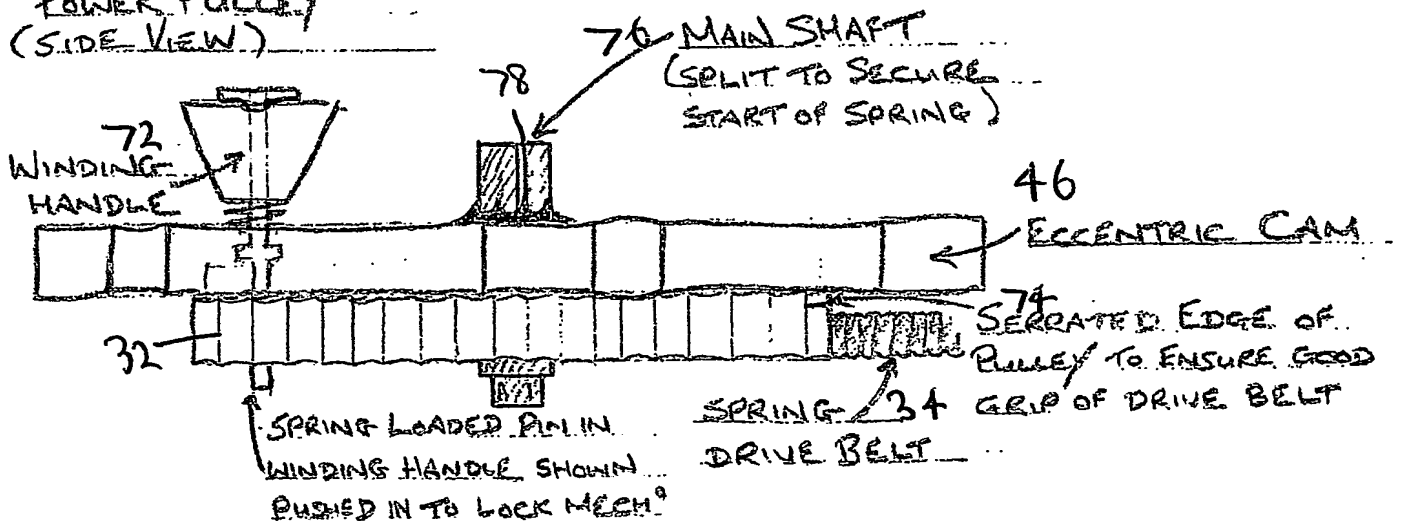


FIG 6

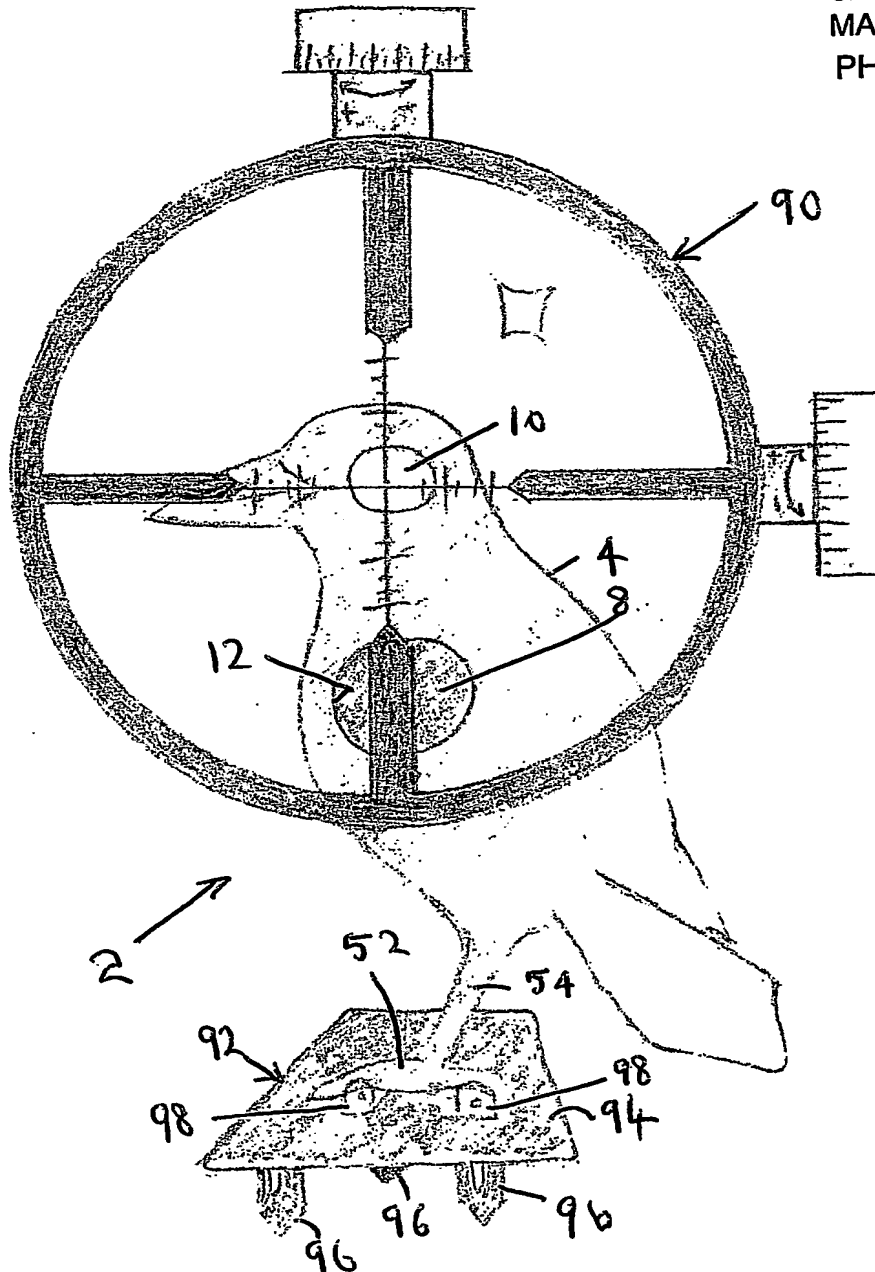
MARKETING DIRECTOR JOHN CROPPER · DESIGN DIRECTOR NOEL TIERNEY

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TARGET INNOVATIONS

DESIGNERS & MANUFACTURERS OF AUTOMATED
AIRGUN TARGETS

UNIT E1/G1,
SPRINGFIELD IND ESTATE
SAMUEL ST, FAILSWORTH
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THE AUTO RELOADING AIRGUN TARGET

FIG 7

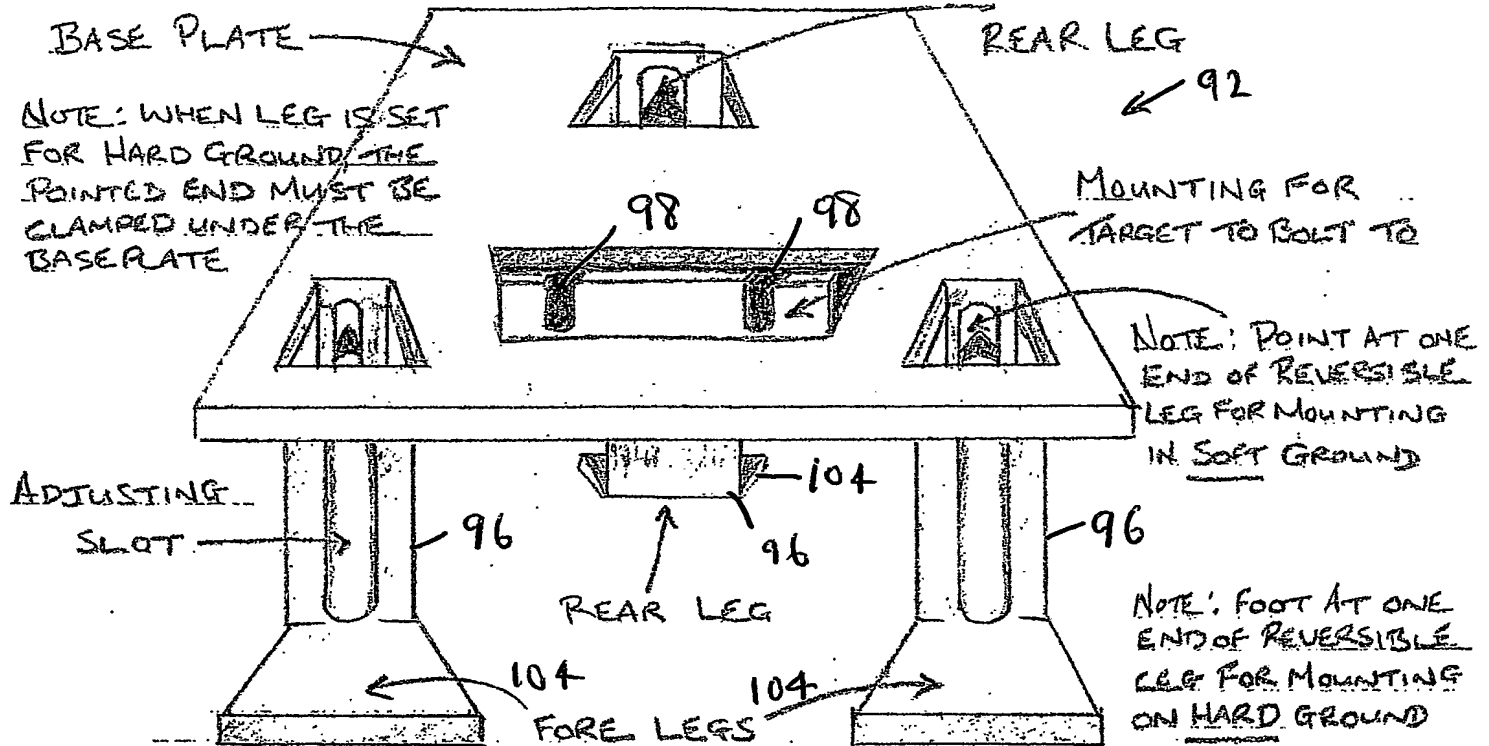


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AIRGUN TARGETS

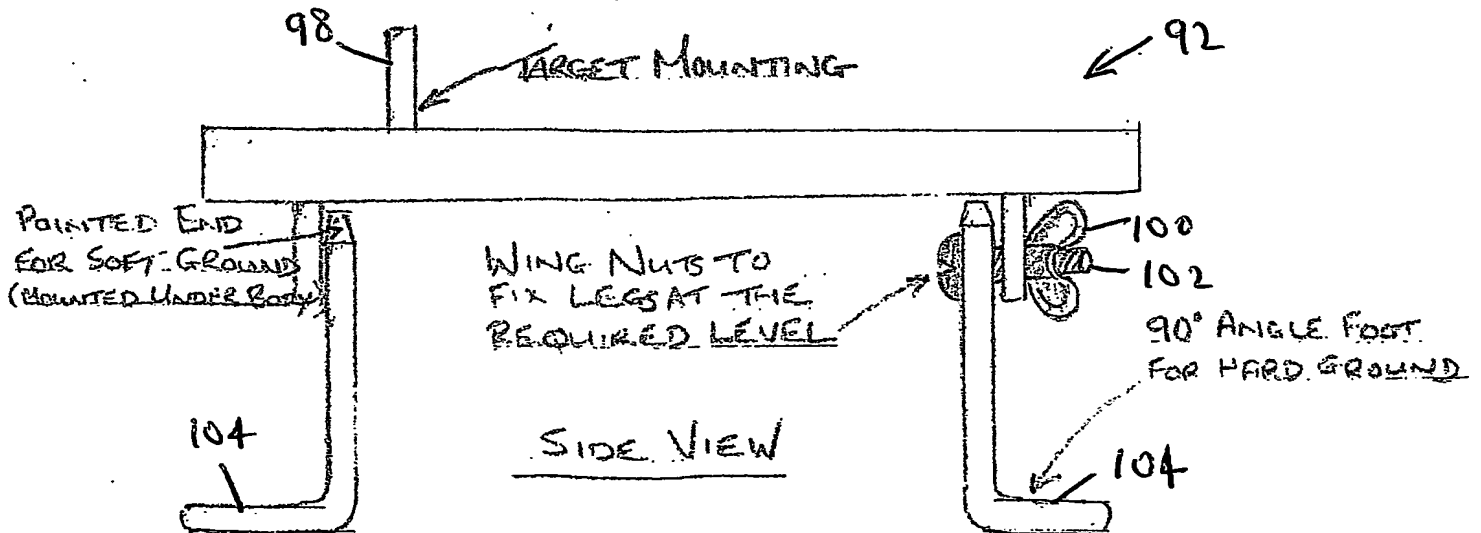
UNIT E1/G1,
SPRINGFIELD IND ESTATE
SAMUEL ST, FAILSWORTH
MANCHESTER M35 0GA
PHONE 0161-681 1150

THE STAND



ELEVATED FRONT VIEW

FIG 8



SIDE VIEW

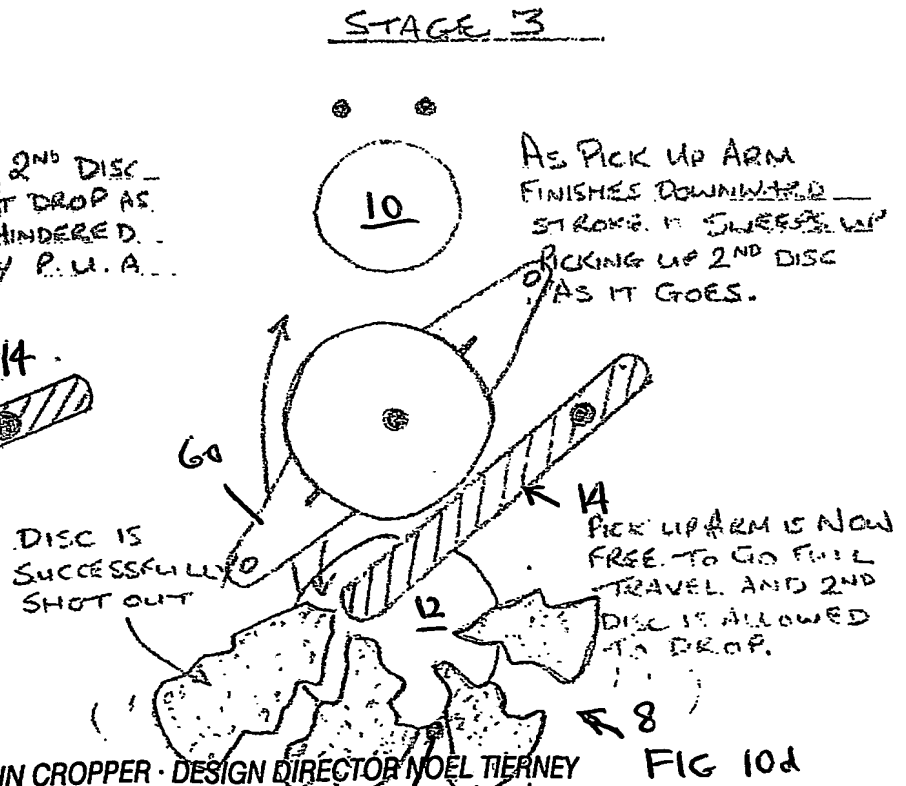
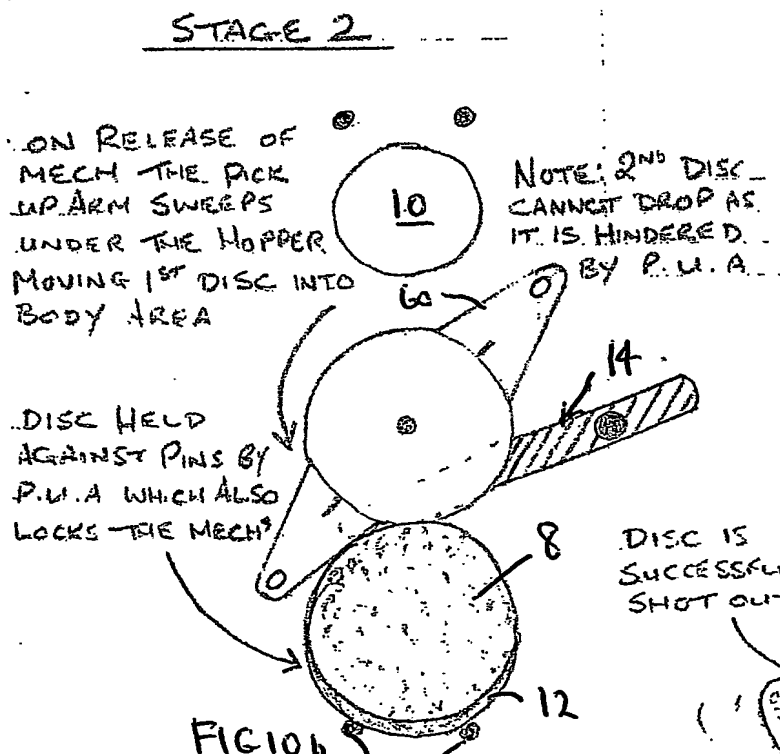
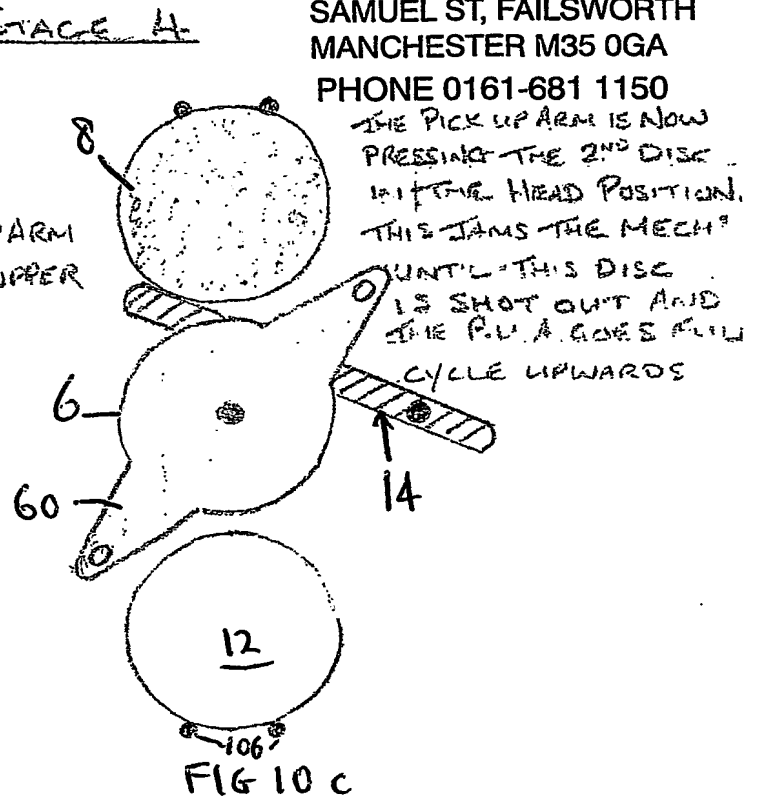
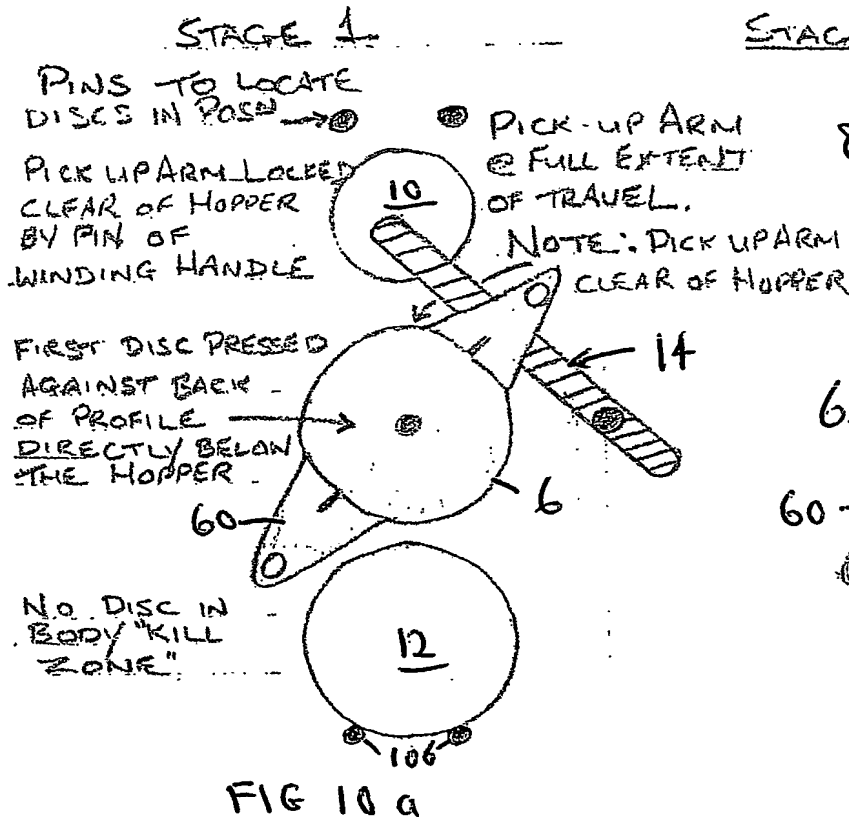
FIG 9

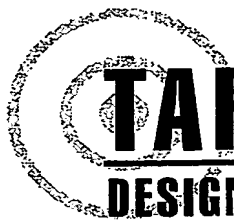
TARGET INNOVATIONS

DESIGNERS & MANUFACTURERS OF AUTOMATED AIRGUN TARGETS

UNIT E1/G1,
SPRINGFIELD IND ESTATE
SAMUEL ST, FAILSWORTH
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PHONE 0161-681 1150





TARGET INNOVATIONS

DESIGNERS & MANUFACTURERS OF AUTOMATED
AIRGUN TARGETS

UNIT E1/G1,
SPRINGFIELD IND ESTATE
SAMUEL ST, FAILSWORTH
MANCHESTER M35 0GA
PHONE 0161-681 1150

STAGE 5

THE PICK UP ARM NOW
BEGINS ITS DOWNWARD
SWEEP PICKING UP
DISC 3 AND PLACING
IT INTO THE BODY
KILL ZONE

8 WHEN DISC IS SHOT
OUT OF HEAD AREA
THE PICK UP ARM GOES
FULL TRAVEL ALLOWING
DISC 3 TO BE FED
INTO PLACE.

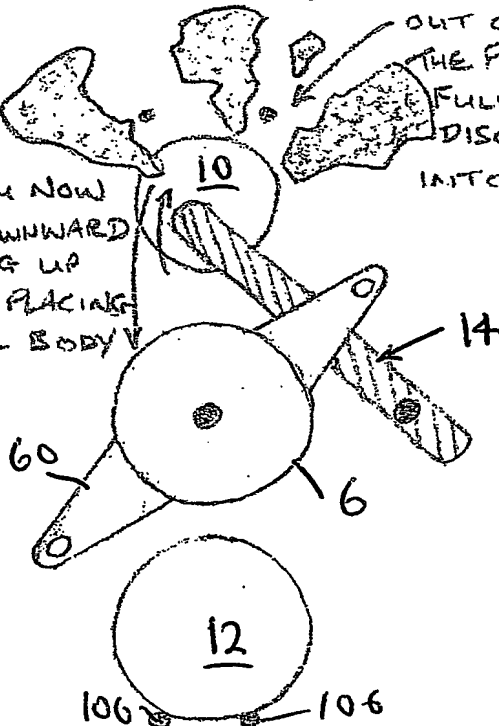


FIG 10e

STAGE 6

THE TARGET MECHANISM HAS NOW
EFFECTIVELY RETURNED TO
STAGE 2. THE CYCLE NOW
CONTINUES UNTIL ALL 20 DISCS
HAVE BEEN SHOT.

THE PICK UP ARM EVENTUALLY
COMES TO REST AGAINST
THE PUSH PLATE IN THE
HOPPER. NOW REMOVE HOPPER,
RELOAD & ENJOY ALL OVER AGAIN.

FIG 10f)

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TARGET INNOVATIONS

DESIGNERS & MANUFACTURERS OF AUTOMATED AIRGUN TARGETS

UNIT E1/G1,
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SAMUEL ST, FAILSWORTH
MANCHESTER M35 0GA
PHONE 0161-681 1150

THE APERTURE REDUCING INSERT

FRONT VIEW

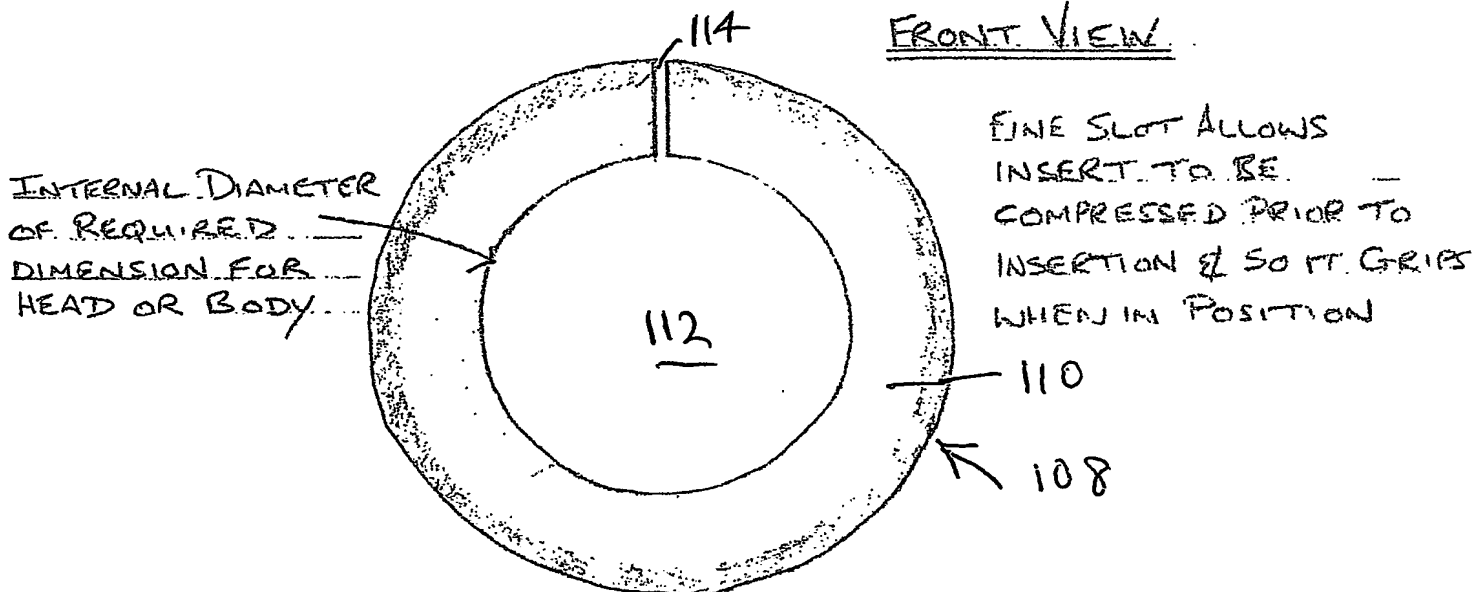
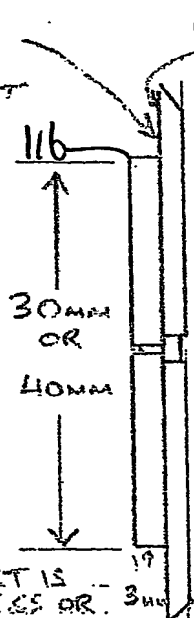


FIG 11

REAR VIEW

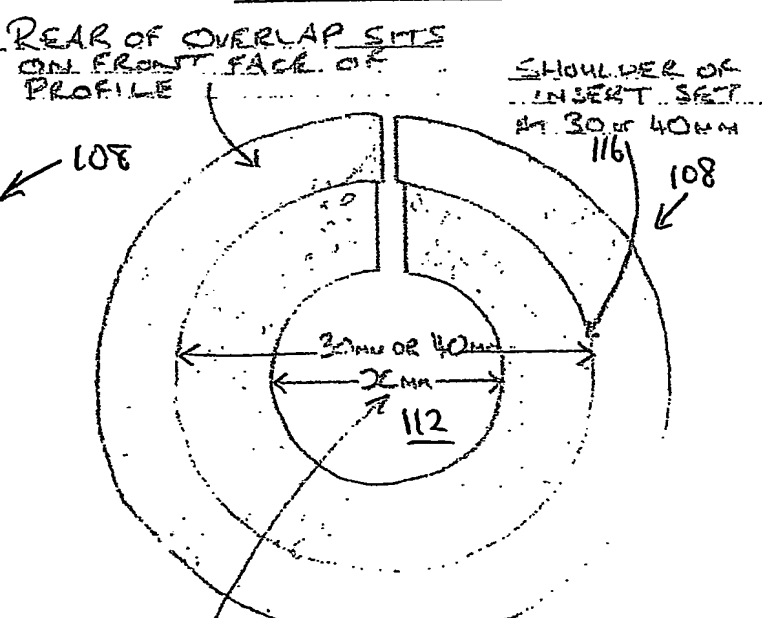
OVERLAP PREVENTS INSERT BEING PUSHED THROUGH UPON IMPACT

INSERT SHOULDER OF 30MM OR 40MM FOR HEAD OR BODY RESPECTIVELY



SHOULDERED INSERT IS OF SAME THICKNESS OR LESS THAN PROFILE SO IT DOES NOT INTERFERE WITH THE DISC

FIG 12



APERTURE OF INSERT CAN BE MADE ANY SIZE, VIRTUALLY DOWN TO SIZE OF PELLET IF REQUIRED

FIG 13

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